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L56 ANSWER 1 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
AN 2005-607561 [63] WPIX Full-text
DNC C2005-183032 [63]
DNN N2005-498172 [63]
TI Monitoring and measuring the volume of a liquid
droplet discharged from a liquid
dispensing system, comprises using a liquid to form
part(s) of three components of a capacitor
DC B04; D16; P42; S02
IN FRANKEN C; MAKAROV S; OSING J; SHVETS
A; SHVETS I
PA (ALLE-N) ALLEGRO RES LTD; (FRAN-I) FRANKEN C; (MAKA-I) MAKAROV S; (OSIN-I)
OSING J; (SHVE-I) SHVETS A; (SHVE-I) SHVETS I
CYC 37
PIA EP 1568415 A2 20050831 (200563)* EN 27[14]
US 20050223814 A1 20051013 (200567) EN
ADT EP 1568415 A2 EP 2005-394006 20050223; US 20050223814 A1 US
2004-787229 20040227
PRAI US 2004-787229 20040227

AB EP 1568415 A2 UPAB: 20051223

NOVELTY - Monitoring and measuring the volume of a liquid droplet discharged from a

liquid dispensing system comprises measuring an electrical property arising from the separation of the droplet from the nozzle, using the liquid to form part(s) of the three components of the capacitor, and measuring the change in capacitance in the capacitor as the liquid is discharged from the nozzle.

DETAILED DESCRIPTION - Monitoring and measuring the volume of a liquid droplet discharged from a liquid dispensing system comprises measuring an electrical property arising from the separation of the droplet from the nozzle (5), using the the liquid to form part(s) of the three components of the capacitor, and measuring the change in capacitance in the capacitor as the liquid is discharged from the nozzle, thus the volume of liquid dispensed and termination of discharge may be recorded. The three components of the capacitor is a dielectric, and two separate electrically conductive mechanisms. The liquid dispensing system comprises a nozzle with dispensing tip (7). An INDEPENDENT CLAIM is included for a liquid droplet monitoring and measuring apparatus (1) for a droplet dispenser of a type comprising a nozzle with a dispensing tip, a mechanism for delivering the liquid under pressure through the nozzle onto a receiving substrate, an electrically conductive mechanism, a mechanism for mounting the electrically conductive mechanism adjacent the dispensing tip, mechanisms for electrically energizing the liquid with alternating current, and a mechanism for measuring the change in capacitance between the electrically conductive mechanism and liquid droplet as the liquid droplet is formed on and subsequently detached from the dispensing tip.

USE - For monitoring and measuring the volume of a liquid droplet discharged from a

liquid dispensing system (claimed).

ADVANTAGE - The invention provides comfort even if the dispenser functions properly as the user cannot satisfy him/her in this by simple visual monitoring. It eliminates drop to contact with measuring device.

DESCRIPTION OF DRAWINGS - The figure shows a diagrammatic representation of liquid monitoring and measurement apparatus. Liquid droplet monitoring and measuring apparatus (1)

Outer shield (3)

Nozzle (5)

Dispensing tip (7)

Electrode (11)

Preamplifiers (16)

Low pass filter (19)

Signal conditioning amplifier (20) Signal read out device (21)

TECH

MECHANICAL ENGINEERING - Preferred Methods: The method includes electrically energizing the liquid with alternating current and measuring the capacitance induced in the electrically conductive mechanism sited adjacent the tip as the liquid is discharged from the nozzle. The method comprises sitting the nozzle in the conductive chamber with an outlet to allow the passing of liquid through it from the nozzle dispensing tip, energizing the liquid by applying voltage at preset carrying frequency, and measuring capacitance induced by the interaction of liquid and chamber until the liquid detaches from the nozzle. The initial calibration step is performed by dispensing initially droplets, measuring the change in capacitance, weighing the droplets, and storing data for subsequent use, measuring change in capacitance caused by jet immediately before and after the formation of droplet to determine the volume and other characteristics of droplet.

Preferred Components: The liquid droplets forms electrically conducting mechanism of the capacitor. The liquid and nozzle are high electrical conductivity. An electrode (11) is provided remote from and beneath the nozzle. The nozzle and electrode form plates for the capacitor, thus the growth of droplet on the dispensing tip increases the capacitance until it drops on detachment of the droplet from the dispensing tip. The liquid droplet forms a dielectric mechanism positioned in the vicinity of electrically conducting mechanism of the capacitor and alternates the effective dielectric constant of the capacitor. The liquid is electrically non-conductive. The liquid is a water based liquid. The liquid is energized at a frequency of 100 KHz-5MHz. The liquid is energized with alternating and direct current. The volume of the liquid is calculated from the change in capacitance and charge carried by the liquid droplet. When the variance between the calculated volumes exceeds a preset amount, a possible malfunction is recorded. The liquid is delivered from the nozzle in a continuous jet. The jet forms separate droplets remote from the dispensing tip while still maintaining the jet. The information on the characteristic of droplets is used to control the manner where the jet is formed. The liquid is not discharged from the apparatus. The capacitance is measured and monitored to provide an indication of possible leak in the apparatus on change in capacitance detected. The mechanism for energizing the liquid is radio frequency oscillator. The electrically conductive mechanism comprises a cylindrical chamber. The electrically conductive mechanism comprises an open ended sleeve with a entrance for reception of a nozzle and exit for discharge of a droplet. The nozzle is electrically conductive. The electrically conductive mechanism is mounted beneath the dispensing tip and spaced-apart from it. The apparatus comprises an additional direct current source for energizing the liquid with direct current and a mechanism for sensing when the droplet exits the apparatus. The electrically conductive mechanism is a capacitor. The capacitor is formed from two spaced apart electrically conductive plates.

L56 ANSWER 2 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 2005-243287 [26] WPIX Full-text

DNN N2005-200218 [26]

TI Liquid drop measuring method and device

DC S02; T01

IN LI B; SHEN T; ZHANG T

PA (UYSH-N) UNIV SHANGHAI

CYC 1

PIA CN 1558187 A 20041229 (200526)* ZH [0]

ADT CN 1558187 A CN 2004-10016262 20040212

PRAI CN 2004-10016262 20040212

AB CN 1558187 A UPAB: 20050709

NOVELTY - The present invention relates to one kind of liquid drop measuring method and device. The measurement method includes adopting two vertically superposed position sensors and one capacitive sensor to measure the time for the liquid drop to pass through, adopting a frequency counter to count frequency and adopting microprocessor to calculate the liquid drop volume. The device includes two photoelectronic sensors, one capacitive sensor, one capacitance /frequency converter, one frequency pulse counter and one

microprocessor. The present invention can measure the volume of each falling liquid drop directly with high precision and fast dynamic speed.

L56 ANSWER 3 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 2004-033953 [03] WPIX Full-text
 DNC C2004-011148 [03]
 DNN N2004-027002 [03]
 TI Modifying electrodes in array of electrodes by binding respective probe molecule to electrodes to be modified, dissociating respective probe molecule from electrode and contacting each electrode with respective liquid
 DC B04; D16; S02; S03
 IN KUNWAR S; MATHAI G T; PISHARODY S; SCABOO K
 PA (GENO-N) GENORX INC; (KUNW-I) KUNWAR S; (MATH-I) MATHAI G T; (PISH-I) PISHARODY S; (SCAB-I) SCABOO K
 CYC 105
 PIA US 20030224387 A1 20031204 (200403)* EN 34 [11] <--
 WO 2004061133 A1 20040722 (200448) EN
 AU 2003300277 A1 20040729 (200477) EN
 ADT US 20030224387 A1 Provisional US 2002-382074P 20020522; US 20030224387 A1 US 2002-327868 20021226; AU 2003300277 A1 AU 2003-300277 20031222; WO 2004061133 A1 WO 2003-US41002 20031222
 FDT AU 2003300277 A1 Based on WO 2004061133 A
 PRAI US 2002-327868 20021226
 US 2002-382074P 20020522
 AB US 20030224387 A1 UPAB: 20050527
 NOVELTY - Modifying (M1) electrodes (I) in an array of electrodes involves overlying each of at least two electrodes (II) to be modified with a respective protective molecule (III), binding respective probe molecule to (II) and dissociating (III) from a electrode overlaid by a protective molecule and contacting each of electrodes in several subsets of (I) with a respective liquid.
 DETAILED DESCRIPTION - Modifying (M1) electrodes (I) in an array of electrodes involves overlying each of at least two electrodes (II) to be modified with a respective protective molecule (III) such that (III) inhibits probe molecules from binding to the two electrodes, binding respective probe molecule to (II), and: (a) dissociating (III) from a electrode overlaid by a protective molecule and contacting each of electrodes in several subsets of (I) with a respective liquid, where each liquid comprises a respective different probe molecule, and an electrode is subjected to both steps of dissociating and contacting the respective different probe molecule of the respective liquid which binds to the electrode; (b) contacting several of (I) with a liquid (IV) and dissociating a protective molecule from one of the electrodes in contact with (IV) where the probe molecule of (IV) binds to the electrode which is subjected to contacting and dissociating steps; and (c) addressing one of (I) with a dissociation potential and contacting (I) with a liquid comprising a probe molecule or a protective molecule, where one of probe molecule and one of the protective molecule bind to the first electrode. INDEPENDENT CLAIMS are also included for the following: (1) modifying (M2) electrodes in an array of electrode pairs, where each electrode pair comprises a first and second electrode involves overlying each of the first and second electrodes in a electrode pair with (III) such that (III) inhibits probe molecules from binding to the two electrodes, binding respective probe molecule to the first and second electrodes of the electrode pairs, dissociating a protective molecule from the first electrode of the electrode pair without dissociating a protective molecule from the second electrode of the electrode pair, and contacting the first and second electrode of the electrode pair in the array of electrode pair with a liquid comprising a first probe molecule, where the

first and **second** electrodes of the electrode pair being spaced apart by less than 1000 Å and the first probe molecule of the liquid binds to the first electrode; (2) forming (M3) an electrical connection between first electrode and a **second** electrode of an electrode pair involves binding a first molecule to the first electrode where the first molecule comprises a first single stranded polynucleotide, binding a **second** molecule to the **second** electrode where the **second** molecule comprises an intercalating group configured to intercalates with double stranded polynucleotides, and contacting the electrode pair with a **second** single stranded polynucleotide at least partially complementary to the first polynucleotide, where the first and **second** polynucleotides form a duplex region and the intercalating group intercalates with the duplex region thus forming the electrical connection between the first and **second** electrodes; (3) preparing (M4) a sensor involves binding a first molecule to a first electrode, binding a **second** molecule to a **second** electrode, where if the first electrode pair is contacted with a liquid comprising a **second** single stranded polynucleotide sequence at least partially complementary to the first polynucleotide sequence, the first and **second** polynucleotide sequences will form a duplex region and the intercalating group will intercalate with the duplex region thus modifying an electrical characteristic of the first and **second** electrodes, thus the presence of the at least partially complementary polynucleotide may be determined; (4) an apparatus (V) for preparing an array of modified surfaces comprising a device configured to contact electrodes of each of a number N subsets of electrodes an array of electrodes with a respective liquid, where each liquid comprises a respective different compound and N is an integer greater than 1 and for each subset of the N subsets of electrodes modify an electrical potential between at least a first electrode of the subset of electrodes and a reference electrode, thus the respective compound of the fluid contacting the first electrode binds to the first electrode; and (5) a sensor comprising a substrate which comprises a first electrode pair comprising first and **second** electrode; first molecule comprising first polynucleotide, bound with first electrode, and a **second** molecule comprising a group configured to intercalate with double stranded polynucleotide compounds, bound with **second** electrode.

USE - (M1) is useful for preparing sensors that are useful for detecting a wide range of macromolecules as well as macromolecules binding events.

DESCRIPTION OF DRAWINGS - The figure shows the top view of an exemplary biosensor.

TECH

BIOTECHNOLOGY - Preferred Method: In (M1), at least 2, 25 or 100 electrodes that are subjected to both dissociating and contacting steps are members of respective different subsets of electrodes. The contacting step is performed after dissociating step for some subsets in the several of the subsets of electrodes that comprise at least 2 or 5 member electrodes but fewer than 50 or 25 member electrodes. The dissociating step is performed while the subsets of electrodes are in contact with the respective liquids in the contacting step for at least some subsets in the several of the subsets of electrodes. Contacting step further comprises contacting each subset of a first portion in the several of the subsets with the respective liquid, while the subsets in the first portion of subsets remain in contact with the respective liquids, contacting each subset of a **second** different portion in the several of the subsets with the respective liquid. While performing the contacting step, at least 25 or 100 of the subsets of electrodes in simultaneous contact with the respective liquid comprises a respective different molecule. The contacting step involves simultaneously contacting at least some subsets in the several of the subsets of the electrodes with the respective liquid where the respective liquids comprise at least two different liquids. The dissociating step involves modifying an electrical potential difference between the electrode and a reference electrode for

each electrode in several of the electrodes, thus a respective protective molecule dissociates from the electrode. The contacting step further involves contacting a respective, different reference electrode with the respective liquid for each of at least two subsets in the several of the subsets of electrodes, thus electrically contacting the electrodes in the subset of electrodes and the reference electrode or respective different reference electrode. The liquid used in contacting step does not electrically connect the subset with the respective reference electrodes of other subsets of electrodes. The contacting step further involves applying a droplet of liquid to the subset of electrodes and reference electrode where each droplet of liquid comprises a respective different probe molecules. (M1) further involves repeating the dissociating and contacting steps until a respective probe molecule is bound to each of at least 50 or 500 electrodes of the array. (M1) further comprises prior to performing the steps of dissociating and contacting, overlaying a several of the electrodes with a protective molecule by contacting the electrodes with a liquid comprising a protective molecule, where a protective molecule binds to electrodes of the array. The protective molecule is chosen from one of the alkylsiloxane, an alkanethiol containing 1-22 carbon atoms and a fatty acid. A respective protective molecule is bound to the each electrode in a several of electrodes, by a sulfur group. The probe molecules comprises a polynucleotide and a binding portion that binds the electrodes, where the polynucleotides bound to different electrodes have different sequences from one another and the binding portion comprising sulfur. The array of electrodes comprises a several of electrode pairs, where the first and the second electrodes of the electrode pairs in the array are spaced apart preferably by less than 500 Å. The dissociating step comprises dissociating the a respective protective molecule from only the first electrode of the electrode pair where the electrode pairs belong to different subsets of the several of subsets of electrodes and the contacting step comprises contacting at least two electrode pairs with respective liquids comprising respective different probe molecules, where for each electrode pair of the two electrode pairs, contacted with respective liquids comprising respective different probe molecules where only the first electrode of the electrode pair is also subjected to the dissociating step, thus the respective different probe molecule of the respective liquid binds only to the first electrode, second electrode of the electrode pair, and contacting both electrodes of the electrode pair with a liquid comprising a probe molecule to be bound to the second electrode of the electrode pair, where the probe molecule to be bound to the second electrode is different form the probe molecule bound to the first electrode, and the probe molecule to be bound to the second electrode of electrode pair binds to the second electrode. The probe molecule bound to one of the first and second electrode comprises the first polynucleotide. The probe molecule bound to the other electrode comprises an intercalating group, where upon contacting the electrode pair with a liquid comprising a target polynucleotide at least partially complementary to the first polynucleotide of the probe molecule bound to the first electrode an electrical resistance between the first and second electrodes will be reduced. The dissociating step is performed without removing the liquid used in the contacting step, where the dissociating step comprises modifying an electrical potential of a electrode or modifying an electrical potential of a electrode and a reference electrode, thus a molecule dissociates from the electrode. (M1) further involves addressing a different electrode with a dissociation potential, contacting electrodes in the array with a liquid comprising different probe molecule, contacting electrodes

of the array with a **liquid** comprising a protective molecule, addressing a electrode in the array of electrodes with dissociation potential where one electrode that was subjected to addressing step and contacting step while not concurrently being subjected to addressing step and contacting step, contacting electrodes in the array of electrodes with a **liquid** comprising a different probe molecule and contacting electrodes in the array of electrode with a **liquid** comprising a protective molecule. The addressing step comprises modifying an electrical potential difference between a electrode and a reference electrode. The addressing step dissociates the protective molecule from the electrode. In (M2), the first probe comprises a polynucleotide or a phosphorothiolated polynucleotide. The **second** probe molecule comprises an intercalating group configured to intercalate with double stranded polynucleotides. In (M3), the **second** molecule comprises a **conductive** oligomer disposed intermediate the intercalating group and a **second** portion of the **second** molecule that is associated with the **second** electrode, where the **second** molecule is free of polynucleotides. The binding of the first and the **second** molecule to the first and the **second** electrode comprises binding a sulfur group of the first and **second** molecule to the first and **second** electrode, respectively. The intercalating group comprises ethidium bromide, acridine or a derivative of ethidium bromide or acridine. Prior to the step of binding the first molecule or **second** molecule to the first electrode or **second** electrode, overlaying the protective molecule upon the first electrode or **second** electrode, thus the protective molecule inhibits the association of first and **second** molecule with the first electrode or **second** electrode. The step of binding the first molecule or the **second** molecule to the first electrode or **second** electrode involves contacting the first and **second** electrodes with the **liquid** comprising the first molecule and modifying an electrical potential difference between the first electrode or **second** electrode and a reference electrode, thus protecting the first electrode or **second** electrode. Binding of the first molecule comprising respective different first polynucleotides to the first electrodes of respective different electrode pairs thus the first polynucleotide bound to different first electrodes will selectively from duplex regions with different **second** polynucleotides. The step of binding a first or **second** molecule to the first or **second** electrode involves contacting at least two subsets or number N subsets of the electrode pairs with respective **liquid** or respective different **second** molecule and modifying an electrical potential difference between the first electrode or **second** electrode of one of the electrode pairs and a reference electrode thus respective first molecule or **second** molecule binds to the first electrode or **second** electrode where N is an integer greater than one and less than Na. In (M4) contacting the subset with respective **liquid** involves applying aliquot of the respective **liquid** to the subset, where the electrode pairs of each subset of electrode pairs or isolated from aliquots of **liquid** applied to other subsets of electrode pairs. (M4) further involves determining an electrical characteristic such as **conductance**, resistance, an impedance or an **capacitance** of the first and **second** electrodes thus the presence of the **second** polynucleotide may be determined. The **second** molecule comprises a **conductive** oligomer disposed intermediate to the intercalating group and a portion of the **second** molecule that is bound to **second** electrode, where **conductive** oligomer comprises a saccharide and an aromatic group.

Preferred Apparatus: (V) is configured to repeatedly contact subsets of

surfaces in the array of surfaces with a respect liquid where each liquid comprises a respective different compound, and modify an electrical potential between the electrode in the subset of electrodes and a reference electrode until a respective different compound has been bound with each electrode in the array of electrodes. (V) further comprises several of droplet preparation devices, where each droplet preparation device is in fluid communication with a respective reservoir that comprises a respective one of the different compounds, and a droplet delivery device configured to deliver droplets prepared by the droplet preparation devices to predetermined subsets in the N subsets of electrodes, thus contact the predetermined subsets with respective liquid. The droplet preparation device comprises a capillary configured to prepare a droplet of fluid, where the droplet preparation devices are configured to prepare droplets by the thermally modifying pressure of the liquid, piezo-electrically modifying the pressure of the liquid and ultrasonically modifying the pressure of the liquid. The device is configured to bind one respective protective molecule to the electrodes of the array, where the respective protective compound inhibits association of the respective different compounds with electrodes. A sensor comprising. Preferred Sensor: The substrate comprises a number Na electrode pairs, each electrode pair comprising a first and second electrode pair, a first molecule bound with the second electrode, the first molecule comprising a first polynucleotide, a second molecule bound with the second electrode, the second molecule comprising a group configured to intercalate with double stranded polynucleotide compounds, and where upon contacting the electrode pair with a liquid comprising a second polynucleotide sequence at least partially complementary to the first and second polynucleotide sequences form a duplex region and the intercalating portion intercalates with the duplex region thereby modifying an electrical characteristic of the first and second electrodes where the presence of the at least partially complementary second polynucleotide may be determined. The different first polynucleotides are found with the first electrodes of respective different electrode pairs, thus the first polynucleotides bound to different first electrodes will selectively form duplex regions with different second polynucleotides.

ABEX EXAMPLE - Bare gold electrodes were cleaned by contacting the electrodes with a solution of 70% sulfuric acid and 30% hydrogen peroxide for one minute to remove organic surface contaminants. Each electrode within the array was protected by forming a self-assembled monolayer of a thiol containing compound on the electrodes. The self-assembled monolayers were prepared by exposing the electrodes of the array to an aqueous solution of 1 mM mercapto hexanol for 1-4 hours. Electrodes of the array were contacted with ethanol to remove any mercapto hexanol molecules which were not non-covalently bound to the electrodes. Electrodes of the array were addressed to deprotect individual electrodes by removing the mercapto hexanol. An electrode to be deprotected was contacted with an aqueous solution comprising 0.1 M potassium hydroxide for 100 seconds. A step voltage of -1.2 volts versus a reference electrode was applied to an electrode which was a silver/chloride electrode, although other reference electrodes may be used. Only electrodes addressed by modifying the potential difference between the electrode and the reference electrode were deprotected. Upon deprotecting an electrode, electrodes of the array were exposed to a liquid comprising a high ionic strength buffered solution of a thiol-terminated oligonucleotide for 1-4 hours. The thiol-terminated oligonucleotide reacted with the surfaces of electrodes that had been deprotected by desorbing the mercapto hexanol to form a self

assembled layer of the thiol-terminated oligonucleotide. Mercaptohexanol bound to electrodes that had not been deprotected inhibited adsorption of the thiol-terminated oligonucleotide thereto. The electrodes of the array were then re-exposed to a liquid comprising 1 mM mercaptohexanol for one hour and rinsed with water to prepare, at the surfaces of the deprotected electrodes, a stable phase capable of supporting hybridization to the thiol-terminated oligonucleotides. The steps of deprotecting one or more electrodes and attaching a thiol-terminated oligonucleotide were terminated oligonucleotide had been formed at the surface of each electrode within the array. The modified array may be exposed to a liquid comprising oligonucleotides at least partially complementary to the thiol-terminated electrodes of the electrode array. Hybridization between a thiol-terminated electrode and a partially complementary oligonucleotide may be determined by monitoring an electrical characteristic, such as a capacitance of each electrode within the array. Thus, the modified electrode array may be used to determine the presence of a several of polynucleotides.

L56 ANSWER 4 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 2003-802623 [75] WPIX Full-text
 DNN N2003-643296 [75]
 TI Multi nozzle dispensing head, has primary and secondary nozzles with internal bore, where secondary nozzles have dispensing tip in which aggregate resistance to flow in all bores is greater than that in split channel
 DC X25
 IN MAKAROV S; OSING J; SHVETS I; SWEENEY D
 PA (MAKA-I) MAKAROV S; (OSIN-I) OSING J; (SHVE-I) SHVETS I; (SWEE-I) SWEENEY
 D
 CYC 1
 PIA US 20030175163 A1 20030918 (200375)* EN 22[11]
 ADT US 20030175163 A1 US 2002-98393 20020318
 PRAI US 2002-98393 20020318
 AB US 20030175163 A1 UPAB: 20050601
 NOVELTY - The head (1) has primary and secondary nozzles (2, 4) with an internal nozzle bore connected adjacent to their proximal ends. A manifold (3) connected to the primary nozzle forms an internal split channel for reception of liquid from the primary bore. Each secondary nozzle has a dispensing tip (5) in which resistance to flow in all the nozzle bores is greater than resistance to flow in the split channel.
 DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a multi nozzle dispensing assembly.
 USE - Used for dispensing assemblies that dispense small volumes (10 microlitres or less) of liquids.
 ADVANTAGE - The head is capable of dispensing four, eight, twelve or even more droplets simultaneously and ensures that the variation in the volumes of the droplets dispensed from the separate channels is small. The dispensing head can be easily disconnected and replaced. DESCRIPTION OF DRAWINGS - The drawing shows a view of a dispensing assembly.
 Dispensing head (1)
 Primary nozzle (2)
 Manifold (3)
 Secondary nozzles (4)
 Dispensing tips (5)
 Dispensing assembly (10)

L56 ANSWER 5 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 2003-579199 [55] WPIX Full-text

DNC C2003-156990 [55]

DNN N2003-460383 [55]

TI Detection of smallest quantities and **flows** of fluids by continuous **droplet** size determination, useful in a medicinal drip unit, employs **capacitative** measurement to control oscillator frequency

DC A85; B07; S02; S03

IN AUGER J; DIERKS K; HENNING B; PRANGE S

PA (AUTO-N) INST AUTOMATION & KOMMUNIKATION EV MAGDE

CYC 1

PIA DE 10162055 A1 20030626 (200355)* DE 8[4] <--

DE 10162055 B4 20070412 (200727) DE

ADT DE 10162055 A1 DE 2001-10162055 20011217

PRAI DE 2001-10162055 20011217

AB DE 10162055 A1 UPAB: 20050904

NOVELTY - Determination of smallest quantities and **flows** of fluids, employs a **capacitative** measurement unit.

DETAILED DESCRIPTION - Determination of smallest quantities and **flows** of fluids, employs a **capacitative** measurement unit. Its **conductive**, hollow-cylindrical electrode (3) surrounds the **droplet** (2).

A **second** electrode is a capillary (1) axi-symmetrically above the cylinder. The assembly determines the frequency of an oscillator circuit (4). The **droplet**, growing at the capillary, varies the **capacity** and hence the frequency. An analysis circuit (5) immediately determines the **droplet** size or volume.

USE - The method is used to measure **droplet** volume and/or **flowrates**. The apparatus can also be used to measure fluid viscosity (claimed), e.g. in a medicinal drip unit.

ADVANTAGE - The method is applicable down to very small **flowrates**, below 1 ml/h. It can be extended to larger **flowrates** by drop counting and/or using units in parallel. **Droplet** size is measured continuously during its formation, using comparatively low-cost equipment. Prior art **droplet** imaging methods are costly by comparison, require image analysis facilities and determine **droplet** size less precisely.

DESCRIPTION OF DRAWINGS - The figure shows a semi-pictorial schematic diagram illustrating the basic principles of measurement. (Drawing includes non-English language text). Capillary (1)

Droplet (2)

Hollow-cylindrical electrode (3) Oscillator circuit (4)

Analysis circuit (5)

TECH

POLYMERS - Preferred Components: The tubular electrode and/or the capillary is coated with an insulating layer, preferably Teflon (RTM; polytetrafluoroethylene).

ELECTRONICS - Preferred Components: The main oscillator circuit oscillates at 1 MHz or more and is LC-, RC- or crystal-controlled. The HF oscillator output is mixed with that of a reference oscillator, facilitating measurement at a lower frequency, the beat frequency.

Further measurement circuitry is included to take measurements allowing for variation of **capacity** with temperature.

A **droplet** collector is used to determine larger flows.

It has a **capacitative** level sensor, in another oscillatory circuit. To extend the measurement range, the number of **droplets** is counted and used to determine the volume or flowrate of the liquid.

The electrode (3) interior is only slightly larger in diameter than the maximum **droplet** size. It partially or entirely surrounds its height, without contacting it. A variant outer electrode is polygonal and may be necked around the **droplet** at the top. The electrode may be perforated or grid-like. Further equipotential electrode configurations

are described. The capillary immersion depth in the surrounding electrode is variable to adjust the basic **capacity** of the assembly, and is selected for reliable oscillator function, even when the **volume** is air-filled. The capillary electrode can be exchanged to suit the **flowrate** or **droplet volume**, as well as its physical characteristics. The surrounding electrode is earthed. The measurement **volume** is shut-off and surrounded by earthed electrical screening, to prevent all forms of interference, including that caused by evaporation and air movements.

L56 ANSWER 6 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 2002-723507 [78] WPIX Full-text
 DNC C2002-204970 [78]
 TI **Liquid droplet dispensing** assembly, e.g. for biomedical applications, detects valve boss movement in main bore and accordingly varies power input to valve boss actuator
 DC B04; B07; D16; J04; P42; Q66
 IN **MAKAROV S; OSING J; SHVETS A; SHVETS I**
 PA (ALLE-N) ALLEGRO TECHNOLOGIES LTD; (MAKA-I) MAKAROV S; (OSIN-I) OSING J; (SHVE-I) SHVETS A; (SHVE-I) SHVETS I
 CYC 99
 PIA WO 2002076615 A2 20021003 (200278)* EN 127[45] <--
 US 20020177237 A1 20021128 (200281) EN <--
 US 6669909 B2 20031230 (200402) EN <--
 EP 1379332 A2 20040114 (200410) EN <--
 AU 2002251437 A1 20021008 (200432) EN <--
 EP 1379332 B1 20051102 (200574) EN
 DE 60207062 E 20051208 (200581) DE
 AU 2002251437 A8 20051020 (200615) EN
 DE 60207062 T2 20060803 (200651) DE
 ADT WO 2002076615 A2 WO 2002-IE39 20020326; US 20020177237 A1
 US 2001-816326 20010326; US 6669909 B2 US 2001-816326
 20010326; AU 2002251437 A1 AU 2002-251437 20020326; AU
 2002251437 A8 AU 2002-251437 20020326; DE 60207062 E DE
 2002-607062 20020326; EP 1379332 A2 EP 2002-720415 20020326
 ; EP 1379332 B1 EP 2002-720415 20020326; DE 60207062 E EP
 2002-720415 20020326; EP 1379332 A2 WO 2002-IE39 20020326;
 EP 1379332 B1 WO 2002-IE39 20020326; DE 60207062 E WO
 2002-IE39 20020326; DE 60207062 T2 DE 2002-607062 20020326;
 DE 60207062 T2 EP 2002-720415 20020326; DE 60207062 T2 WO
 2002-IE39 20020326
 FDT DE 60207062 E Based on EP 1379332 A; EP 1379332 A2 Based on
 WO 2002076615 A; AU 2002251437 A1 Based on WO 2002076615 A; EP
 1379332 B1 Based on WO 2002076615 A; DE 60207062 E Based on WO
 2002076615 A; AU 2002251437 A8 Based on WO 2002076615 A; DE 60207062
 T2 Based on EP 1379332 A; DE 60207062 T2 Based on WO 2002076615
 A
 PRAI US 2001-816326 20010326
 AB WO 2002076615 A2 UPAB: 20060202
 NOVELTY - The assembly includes a metering valve (2) connected to a pressurized liquid delivery source. The valve includes a valve boss (15) movable within a main bore (3) to **dispense liquid** through a **nozzle** (6) on the valve base (5). A detector (25) detects the boss movement, and a controller accordingly varies the power input to a valve boss actuator.
 DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for **liquid droplet dispensing** method.
 USE - For dispensing and aspirating small volumes of liquid for biomedical applications e.g. drug development, medical diagnostics, combinatorial

chemistry techniques, genomics, microarraying and proteomics in biotechnology, instrumentation development in printing technology, etc.

ADVANTAGE - Provides an accurate and improves method that is capable of dispensing droplets ranging between 10 nl and 10 microliter, without much boss bouncing by using the boss movement detector.

DESCRIPTION OF DRAWINGS - The figure shows a side sectional view of the dispensing assembly.

Metering valve (2)

Main bore (3)

Valve base (5)

Nozzle (6)

Valve boss (15)

Detector (25)

L56 ANSWER 7 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 2002-500193 [53] WPIX Full-text
 DNC C2002-141637 [53]
 DNN N2002-396052 [53]
 TI Drop size measurement system in intravenous drip chamber,
 includes capacitor and volume determining system that
 measures change in capacitance as fluid drop moves
 through capacitor
 DC B07; P34; S02; S05
 IN BARNES C W; BARNES W C; BARTZ B J; BROWN H; GRIER M J; KALER C G; LOVELL M
 S; BARNES C
 PA (ALAR-N) ALARIS MEDICAL SYSTEMS INC; (MICT-C) MICROSOFT CORP; (CARD-N)
 CARDINAL HEALTH 303 INC
 CYC 98
 PIA WO 2002040084 A2 20020523 (200253)* EN 24 [3] <--
 AU 2002033925 A 20020527 (200261) EN <--
 US 6562012 B1 20030513 (200335) EN <--
 EP 1335765 A2 20030820 (200362) EN <--
 JP 2004513710 W 20040513 (200435) JA 44
 EP 1335765 B1 20050907 (200559) EN
 DE 60113292 E 20051013 (200568) DE
 US 20050240640 A1 20051027 (200571) EN
 DE 60113292 T2 20060119 (200612) DE
 CA 2429409 C 20070116 (200707) EN
 AU 2002233925 B2 20060824 (200708) EN
 ADT WO 2002040084 A2 WO 2001-US42969 20011120; US 6562012 B1 US
 2000-717437 20001120; US 20050240640 A1 Cont of US 2000-717437
 20001120; CA 2429409 C CA 2001-2429409 20011120; DE
 60113292 E DE 2001-613292 20011120; DE 60113292 T2 DE
 2001-613292 20011120; EP 1335765 A2 EP 2001-984921 20011120
 ; EP 1335765 B1 EP 2001-984921 20011120; DE 60113292 E EP
 2001-984921 20011120; DE 60113292 T2 EP 2001-984921 20011120
 ; EP 1335765 A2 WO 2001-US42969 20011120; JP 2004513710 W
 WO 2001-US42969 20011120; EP 1335765 B1 WO 2001-US42969
 20011120; DE 60113292 E WO 2001-US42969 20011120; DE
 60113292 T2 WO 2001-US42969 20011120; CA 2429409 C WO
 2001-US42969 20011120; AU 2002033925 A AU 2002-33925 20011120
 ; JP 2004513710 W JP 2002-542453 20011120; US 20050240640 A1 US
 2005-171768 20050630; AU 2002233925 B2 AU 2002-233925 20011120
 FDT DE 60113292 E Based on EP 1335765 A; DE 60113292 T2 Based on
 EP 1335765 A; US 20050240640 A1 Cont of US 6562012 B; AU
 2002033925 A Based on WO 2002040084 A; EP 1335765 A2 Based on WO
 2002040084 A; JP 2004513710 W Based on WO 2002040084 A; EP 1335765
 B1 Based on WO 2002040084 A; DE 60113292 E Based on WO 2002040084
 A; DE 60113292 T2 Based on WO 2002040084 A; CA 2429409 C Based

on WO 2002040084 A; AU 2002233925 B2 Based on WO 2002040084 A

PRAI US 2000-717437 20001120

US 2005-171768 20050630

AB WO 2002040084 A2 UPAB: 20060120

NOVELTY - Fluid drop measurement system (10) includes plates (42) that form a capacitor (16), and a volume determining system (18). The plates are positioned on either side of a predetermined path so that the fluid drop passes between them. The volume determining system measures the change in capacitance as the fluid drop (30) moves through the path, based on the change in capacitance.

DETAILED DESCRIPTION - Measurement system (10) comprises two plates (42) that form a capacitor (16) and a volume determining system (18) connected to the capacitor. The plates are separated by and positioned on either side of a predetermined path so that a fluid drop (30) passes between the plates as it moves through the path, thus changing the capacitance. The volume determining system measures the change in capacitance as the fluid drop moves through the path. It determines the volume of the fluid drop based on the amount of change of capacitance between the two opposing plates. An INDEPENDENT CLAIM is included for a method for determining the volume of a fluid drop using the above system comprising positioning the plates across the predetermined path, measuring the change in the capacitance as the fluid moves through between the plates, and determining the volume of the fluid drop based on the change of the capacitance.

USE - Used for measuring fluid drop size in an intravenous drip chamber.

ADVANTAGE - The apparatus accurately measures the rate of flow of infusion medication for a patient. It is easy to manufacture and easy to use. It directly measures the volume of each drop, eliminating the disadvantage of assuming a drop size or shape.

DESCRIPTION OF DRAWINGS - The figure shows an apparatus for controlling the flow of fluid to a patient. Measurement system (10)

Drip chamber (12)

Capacitor (16)

Volume determining system (18) Control device (20, 22)

Drop (30)

Plates (42)

Resonant circuit (44)

TECH

MECHANICAL ENGINEERING - Preferred Components: The volume determining system comprises a resonant circuit (44) having a resonance frequency determined by the capacitor and an oscillator having a frequency of oscillation determined by the capacitor. The system also integrates the individual determined volumes of fluid drops on a selected period, and provides a volume per unit time signal. The apparatus also includes a drip chamber between the opposing plates, a display connected to the determining circuit, a memory for storing rate of fluid flow, a processor connected to the memory and a flow control device (20, 22) responsive to flow signal of fluid drops.

The drip chamber (12) provides a predetermined path, so that the fluid falling to it changes the capacitance. The display receives the volume per unit time signal and displays a fluid flow rate based on the volume per unit time signal. The processor compares the stored rate of fluid flow to the volume per unit time signal. The change in capacitance of the two plates will result in a proportional change of the resonance frequency of the resonant circuit.

DNC C2002-028418 [13]

DNN N2002-067423 [13]

TI Dispensing assembly for use with liquid
 droplets comprises delivery device for forming liquid
 droplets and for causing the droplets to fall off

DC B07; D16; J04; P42; S02

IN MAKAROV S; OSING J; SHVETS I

PA (ALLE-N) ALLEGRO TECHNOLOGIES LTD

CYC 25

PIA EP 1099483 A1 20010516 (200213)* EN 79[50]

<--

ADT EP 1099483 A1 EP 2000-650123 20000904

PRAI EP 1999-650106 19991111

AB. EP 1099483 A1 UPAB: 20050706

NOVELTY - A dispensing assembly comprises a dispenser having a nozzle bore terminating in a dispensing tip. A delivery device is provided for moving liquid to the dispenser to form droplets and causing the droplets to fall off. The delivery device has a separate pressurized liquid delivery source and the dispenser is a metering device.

DETAILED DESCRIPTION - A liquid droplet dispensing assembly comprises a dispenser having a main bore communicating with a nozzle having a nozzle bore terminating in a dispensing tip. A delivery device is provided to move the liquid to the dispenser and from there through the bore to form a droplet on the exterior of the tip and then to cause the droplet to fall off. The delivery device comprises a separate pressurized liquid delivery source for moving pressurized liquid to the dispenser (40). The dispenser is a metering valve dispenser and comprises an elongate body (41) having a base (49) including a valve seat (43) which forms an entrance to the nozzle (44). The dispenser also includes a valve boss (47) in the main bore (42) having cross-sectional area which is less than that of the main bore. The predetermined area is provided to permit free passage of liquid by passing the valve boss and devices for altering the relative positions of the valve boss and the valve seat between an open position with the valve boss spaced-apart from the valve seat and a closed contact position sealing the valve seat and spaced-apart from the base. An INDEPENDENT CLAIM is also included for a method of dispensing a droplet having a volume less than 10 microL from a pressurized liquid delivery source through a metering valve dispenser.

USE - For dispensing micro-volumes of liquid droplets useful in printing applications.

ADVANTAGE - The invention is capable of dispensing volumes of liquid as small as less than or equal to 10 nL - 10⁻⁸ L, while at the same time it can also be used to dispense larger droplets such as those as large as greater than or equal to 10 microL. The quantity of the fluid dispensed can be freely selected by the operator and accurately controlled by the dispensing system. It is also capable of dispensing a drop of one size followed by a drop of a widely differing size, e.g. a 10 nL drop followed by a 500 nL one. The part of the dispenser that is contaminated by reagents dispensed can be simply disconnected and replaced. An accurate delivery of liquid droplets to a correct target is achieved. The problems of operation of the conventional solenoid valve are improved.

DESCRIPTION OF DRAWINGS - The figure shows a diagrammatic view of a dispensing assembly.

Dispenser (40)

Elongate body (41)

Main bore (42)

Valve seat (43)

Nozzle (44)

Valve boss (47)

Base (49)

TECH

MECHANICAL ENGINEERING - Preferred Components: The valve seat is in the

form of a capillary tube projecting proud of the bases. The valve boss is a floating valve boss of a magnetic material and the device for altering the relative position of the valve boss and valve seat comprises a separate valve boss actuating assembly adjacent the body. The valve boss is biased to a closed position into engagement with the valve seat by an external magnetic field generated by the actuating coil assembly which comprises two separate sets of coils for moving the valve boss in opposite directions within the body.

The actuating coil assembly also comprises a source of electrical power and controller for varying the current over time as each droplet is being dispensed. The valve boss actuating assembly comprises a permanent magnet and a device for moving the magnet along the elongate body towards and away from the valve seat. The valve actuating assembly comprises a pair of spaced apart magnetizing assemblies each comprises a coil wrapped around a core and of soft magnetic material.

The valve boss is in the form of an elongate or cylindrical plug having a convex valve seat engaging surface. A stop is mounted in the main bore, i.e., remote from the valve seat, to limit movement of the floating valve boss. The dispensing assembly also includes a device for measuring the velocity of the valve boss. The dispensing assembly further includes an electrode in the dispensing tip, a separate receiving electrode remote from the tip, and a high voltage source connected to one of the electrodes remote from the tip, and a high voltage source connected to one of the electrodes to provide an electrostatic field.

Synchronous indexing devices are provided for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate. A detector for sensing the separation of the droplet from the dispensing tip and which comprises a source of electromagnetic radiation, a device for focussing the radiation on the end of the dispensing tip, and a device for collecting the radiation transmitted by a droplet on the dispensing tip. The dispenser assembly further includes a bottomless Faraday Pail.

Preferred Apparatus: The valve boss actuating assembly is an electrical coil surrounding the body.

Preferred Properties: The cross-sectional area of the main bore is 50-1500 times greater than that of the nozzle bore and/or in the order times that of the nozzle bore. The nozzle bore diameter has a diameter of 300-75, preferably 200-100 microm.

POLYMERS - Preferred Material: The valve boss is covered with a layer of soft polymer and manufactured from a flexible polymer bonded magnetic material.

METALLURGY - Preferred Material: The body and nozzle are made from stainless steel.

L56 ANSWER 9 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 2001-452948 [49] WPIX Full-text
 CR 2002-091528
 DNN N2001-335349 [49]
 TI Dispensing assembly, for liquid droplets
 comprising dispenser for medical diagnostics, ink jet-printing,
 etc., has seat-forming entrance to nozzle and separate floating
 valve magnetic boss housed in body member
 DC P42; Q66; S02; S05; V02; X25
 IN MAKAROV S; OSING J; SHVETS I
 PA (QUEE-N) QUEEN ELIZABETH COLLEGE DUBLIN
 CYC 26
 PIA EP 1099484 A1 20010516 (200149)* EN 58[38]
 US 6713021 B1 20040330 (200423) EN

US 20040101445 A1 20040527 (200435) EN
 EP 1099484 B1 20060607 (200641) EN
 DE 69931787 E 20060720 (200652) DE
 DE 69931787 T2 20070524 (200735) DE

ADT EP 1099484 A1 EP 1999-650106 19991111; DE 69931787 E DE
 1999-631787 19991111; DE 69931787 E EP 1999-650106 19991111
 ; US 6713021 B1 US 2000-709541 20001113; US 20040101445 A1 Cont
 of US 2000-709541 20001113; US 20040101445 A1 US
 2003-673408 20030930; DE 69931787 T2 DE 1999-631787 19991111
 ; DE 69931787 T2 EP 1999-650106 19991111

FDT DE 69931787 E Based on EP 1099484 A; DE 69931787 T2 Based on
 EP 1099484 A

PRAI EP 1999-650106 19991111

AB EP 1099484 A1 UPAB: 20060117

NOVELTY - A dispenser (40) is a metering valve dispenser and includes an elongate body member (41) having a valve seat (43) forming an entrance to a nozzle (44). A separate floating valve magnetic boss (47) is housed in the body member (41), whose cross sectional area is less than that of the main bore (42) to permit the free passage of liquid bypassing the valve boss (47). A separate valve boss actuating assembly (50,51) is adjacent the body member. DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for: (a) a method of dispensing a droplet having a volume less than ten micro liters from a pressurized liquid delivery source through metering valve dispenser.

USE - As a dispensing assembly for liquid droplets to form a droplet on the exterior of the tip and then to cause a droplet to fall off from it, for printing reagents on a substrate covered with bodily fluids for subsequent analysis or alternatively for printing bodily fluids on substrates.

ADVANTAGE - Allows dispensing of volumes of liquids as small as 10 nl or even smaller, while at the same time it should be possible to dispense larger droplets such as those as large as 10 micro-liters or even greater. The quantity of the fluid dispensed can be freely selected by the operator and accurately controlled by the dispensing system. Capable of dispensing e.g. a 10 nl drop followed by a 500 nl one in comparison to for example ink jet printing where the volume of one dispensation is fixed, and dispensations are only possible in multiples of this quantity. DESCRIPTION OF DRAWINGS - The drawing is a diagrammatic view of a dispensing assembly.

Dispenser (40)

Elongate body member (41)

Valve seat (43)

Nozzle (44)

Floating valve magnetic boss (47) Valve boss actuating assembly (50,51)

L56 ANSWER 10 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1999-432277 [37] WPIX Full-text

DNN N1999-321850 [37]

TI Method of determining volume gas content in two-phase
 flow of unknown flow form

DC S02; S03

IN ZUNFT S

PA (DELF-C) DEUT ZENT LUFT & RAUMFAHRT EV

CYC 26

PIA EP 936462 A2 19990818 (199937)* DE 9[5] <--

DE 19806477 C1 19990826 (199938) DE <--

US 6412351 B1 20020702 (200248) EN <--

ADT EP 936462 A2 EP 1999-102582 19990211; DE 19806477 C1 DE
 1998-19806477 19980217; US 6412351 B1 US 1999-249187 19990212

PRAI DE 1998-19806477 19980217

AB EP 936462 A2 UPAB: 20050521

NOVELTY - The method involves converting the two-phase flow into a droplet (38) flow by causing vortices in the gas and liquid (34) phases. The gas content of the droplet flow is determined using a capacitance measurement technique (30), which involves measuring the permittivity of more than half the droplet flow.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a measurement arrangement for determining a volume gas content

USE - For determining a volume gas content in a two-phase flow of unknown flow form.

ADVANTAGE - Highly reliable measurement results can be achieved with a very simple measurement technique . DESCRIPTION OF DRAWINGS - The figure shows a sectional lateral schematic representation of a measurement arrangement. flow

channel (12)

tube (14)

flow direction (16)

mixer (20)

capacitance measurement arrangement (30) liquid phase (34)

drops (38)

L56 ANSWER 11 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1998-231582 [21] WPIX Full-text

DNN N1998-183386 [21]

TI ~~Capacitive~~ fluid level detector for container - uses current drawn by HF oscillator to measure amount of dielectric fluid

DC S02; X22

IN BLUSZIS K

PA (BLUS-I) BLUSZIS K

CYC 1

PIA DE 19642026 A1 19980416 (199821)* DE 7[3] <--

ADT DE 19642026 A1 DE 1996-19642026 19961011

FDT DE 19642026 A1 Add to DE 19601691 A

PRAI DE 1996-19642026 19961011

AB DE 19642026 A1 UPAB: 20050521

The detector has measurement capacitor (3) arranged in the container, such that its capacitance changes with the fluid level. The current through the HF oscillator (2) is measured via the voltage across a resistor (4). A reference capacitor (9) can be connected to the HF oscillator instead of the measurement capacitor by means of two electronic switches (2.11,2.12). A microprocessor controls the switching and displays the results on a LCD (5). The measurement resistor can be connected in series with the DC supply to the electronic switches to measure the voltage drop.

USE - For measuring oil level in vehicle engines or oil tanks.

ADVANTAGE - Eliminates effect of temperature drift of DC supply by use of reference capacitor.

L56 ANSWER 12 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1998-131625 [13] WPIX Full-text

DNN N1998-103925 [13]

TI Fluid droplet volume measuring method for precipitation determination - has each droplet electrically charged for measurement of droplet volume by detection of droplet charge capacitance.

DC S02

IN WINDOLPH H

PA (WIND-I) WINDOLPH H

CYC 19

PIA DE 19635348 C1 19980305 (199813)* DE 7[2] <--

WO 9809151 A1 19980305 (199816) DE 22[2] <--

US 20010045126 A1 20011129 (200202) EN <--
 US 6439068 B2 20020827 (200259) EN <--
 ADT DE 19635348 C1 DE 1996-19635348 19960831; WO 9809151 A1 WO
 1997-EP4720 19970829; US 20010045126 A1 WO 1997-EP4720
 19970829; US 6439068 B2 WO 1997-EP4720 19970829; US
 20010045126 A1 US 1999-147731 19991004; US 6439068 B2 US
 1999-147731 19991004
 FDT US 6439068 B2 Based on WO 9809151 A
 PRAI DE 1996-19635348 19960831
 AB DE 19635348 C1 UPAB: 20050520
 The droplet volume measuring method has a fluid volume divided into individual droplets which are provided with an electrical charge, which is dependent on the potential difference and the capacitance of the droplets relative to the background.
 The volume of each droplet is determined by measuring the capacitance by conversion into a corresponding voltage, detected as a voltage variation upon the droplet striking an electrode held at the background potential.
 USE - For droplet regulated pressure infusion apparatus.
 ADVANTAGE - Accurate measurement of volume of individual droplets via respective capacitance values.

L56 ANSWER 13 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 1996-221621 [22] WPIX Full-text
 DNN N1996-186057 [22]
 TI Capacitance probe for fluid flow and volume measurements especially for measuring urine flow in persons on spacecraft missions - has electrodes with fluid flowing between them with reflection signal being transmitted to detection circuit and responsive to permittivity of fluid.

DC S02; S03
 IN AENDT G D; ARNDT G D; CARL J R; NGUYEN T X
 PA (USAS-C) NASA US NAT AERO & SPACE ADMIN

CYC 1
 PIA US 400703 A0 19960215 (199622)* EN 35[6] <--
 US 5596150 A 19970121 (199710) EN 3 <--
 ADT US 400703 A0 US 1995-400703 19950308
 PRAI US 1995-400703 19950308
 AB US 8400703 N UPAB: 20060110

The capacitance probe measures the flow volume of a material within a flow stream. The probe has two parallel elongated electrodes spaced apart by an amount dependent on the size of a droplet of the fluid being measured. A signal generator produces a reference signal for the probe. A cable applies the reference signal to the probe and conducts a reflection signal to detection circuitry that is responsive to the permittivity of the fluid flow stream and produces an analogue permittivity signal. A conductance probe is also provided to give more accurate flow volume data in response to conductivity of the material in the flow stream. An analogue conductivity signal is generated. Both analogue signals are converted to digital signals which provide an output related to the flow of material within the flow stream.
 USE/ADVANTAGE - To determine e.g. amount of salt in solution, monitoring fluids with close permeabilities e.g. two oils, volume fractions of immiscible fluids, detecting impurities in water etc. - Reliable and accurate.

L56 ANSWER 14 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 1991-030056 [05] WPIX Full-text
 DNN N1991-023227 [21]
 TI Measuring level of electrically conducting liquid -

has measuring of infusion liquid or blood from change in capacitance of electrodes in measurement liquid

DC P34; S02; S05

IN POLASCHEGG H D

PA (FREP-C) FRESENIUS E CHEM PHARM

CYC 1

PIA DE 3923079 A 19910124 (199105)* DE <--

DE 3923079 C 19911219 (199151) DE [3] <--

ADT DE 3923079 A DE 1989-3923079 19890713; DE 3923079 C DE

1989-3923079 19890713

PRAI DE 1989-3923079 19890713

AB DE 3923079 A UPAB: 20050430

The level of an electrically conducting liquid is determined from the capacitance change of a capacitor containing two electrodes. The wall of the container holding the liquid is a dielectric which determines the capacitance. The electrically conducting liquid (15) forms one of the electrodes whose change in area is evaluated. The other electrode (5) is mounted outside the container and extends over the entire possible fill height.
USE/ADVANTAGE - For accurate simple measurement of the level of infusion liquid and blood in medical applications, especially in an infusion spray pump drop chamber and especially of small quantities.

L56 ANSWER 15 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1991-000559 [01] WPIX Full-text

DNC C1991-000255 [21]

DNN N1991-000456 [21]

TI Measuring liquid flow rate - by counting drops and processing data from counting sensor

DC J04; S02; T06; X27

IN FLESSENKEM T

PA (FARH-C) HOECHST AG

CYC 1

PIA DE 3919859 A 19901220 (199101)* DE <--

ADT DE 3919859 A DE 1989-3919859 19890619

PRAI DE 1989-3919859 19890619

AB DE 3919859 A UPAB: 20050430

A unit (6), which can be flangedly mounted on a recipient vessel or pipe, has an internal feeder (1), with an open end through which fell drops of liq from a feeder coupled to an external supply source.

The falling drops are counted by an inbuilt sensor (5) of known type, eg. with a sensitive mechanical switch, capacitative or optical. The drop rate is converted by an external computer into total flow rates, pref. in the range 0.1-20.0 ml/min. Incoming material, esp if viscous, may be heated by a sleeve (18), which therefore also permits supply of molten material. USE/ADVANTAGE - Used for supplying analytical chemical reagents or liquid detergent/additives with washing machines. Provides precise readings, and detects flow rate variation.

L56 ANSWER 16 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1990-180416 [24] WPIX Full-text

DNC C1990-078267 [21]

DNN N1990-140228 [21]

TI Impedance cross correlation logging tool for use in borehole - for determining at least one characteristic of the discontinuous phase two-phase liquid circulating around the tool

DC H01; Q49; S03; X25

IN LUCAS G

PA (SLMB-C) SCHLUMBERGER LTD; (SLMB-C) SOC PROSPECTION ELEC SCHLUMBERGER

CYC 7

PIA EP 372598 A 19900613 (199024)* EN <--
 NO 8904817 A 19900625 (199031) NO <--
 GB 2227841 A 19900808 (199032) EN <--
 CA 2002584 A 19900603 (199034) EN <--
 US 4975645 A 19901204 (199051) EN <--
 GB 2227841 B 19930512 (199319) EN 0[1] <--
 EP 372598 B1 19941214 (199503) EN 18[7] <--
 DE 68920010 E 19950126 (199509) DE <--

ADT EP 372598 A EP 1989-202782 19891106; GB 2227841 A GB
 1988-28271 19881203; GB 2227841 B GB 1988-28271 19881203;
 DE 68920010 E DE 1989-68920010 19891106; EP 372598 B1 EP
 1989-202782 19891106; DE 68920010 E EP 1989-202782 19891106
 ; US 4975645 A US 1989-440008 19891121

FDT DE 68920010 E Based on EP 372598 A

PRAI GB 1988-28271 19881203

AB EP 372598 A UPAB: 20050430

The tool can be used to measure the volume fraction or the volume flow rate of the discontinuous or dispersed phase in oil/gas by suspending downhole.

Prof. comprises three main cylindrical sections (24), (26), and (28), joined in axial alignment by two intermediate non-conductive sections (32) and (34) and terminating at the lower extremity in a nose section (30). The assembly is centralised in the borehole by means of stabilising fins on section (24).

Running axially through the tool is wiring duct (36) carrying screened cables connecting the electrodes (38), (52) and (53) of measurement sections 26 and 28 and sensors (60) and (62) of section (34) to the electrode section (24).

Void fraction measuring section (26) has a first set of eight electrodes (38) equi-spaced radially around its axis. A second and third identical set of (8) electrodes (48) and (50) respectively, similarly equi-spaced as electrodes (38) above, form the cross correlation velocity measurement section (28). All electrodes of the three sets of eight are aligned along the same generatrices of the tool.

ADVANTAGE - Valid measurements can be made, even in boreholes deviated from the vertical, with an accuracy which has not been obtained before this method. The method could also be used to measure the flow rate of any other phase such as water or solids distributed in separate or droplets in a continuous medium of a non - conducting fluid. @ (14pp Dwg.No.1/7)@

L56 ANSWER 17 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1990-083178 [11] WPIX Full-text

TI low level monitoring method for liquid dropper - detects remaining quantity of liquid by using variations of electrostatic capacity occurring between two electrodes

DC S02; W05

IN SUZUKI T

PA (TOPL-N) TOHO PLASTIC CO; (TOPL-N) TOHO PLASTIC CO LTD

CYC 1

PIA US 4896099 A 19900123 (199011)* EN 8[10] <--
 US 34073 E 19920922 (199241) EN 7[10] <--

ADT US 4896099 A US 1988-284040 19881214; US 34073 E US
 1988-284040 19881214; US 34073 E US 1991-637572 19910103

FDT US 34073 E Reissue of US 4896099 A

PRAI JP 1988-30591 19880210

AB US 4896099 A UPAB: 20060106

The low level monitoring method comprises the steps of applying a pulse of a stable level to at least one of detecting electrodes attached to an outer surface of a lower portion of a liquid-containing dropper. A level of the pulse passed through an interior of the dropper is compared with a reference pulse level. The reference pulse level is between a level of the pulse passed

through the interior of the dropper when the liquid exists for defining an electrostatic **capacity** between the detecting electrodes and that of the pulse passed through the interior of the dropper when a remaining quantity of the liquid in the dropper decreases to such an extent that a significantly reduced electrostatic **capacity** is defined between the detecting electrodes. An annunciator is automatically actuated when a judgement signal representative of unfavourable results derived from the stop of comparing with the reference pulse level.

L56 ANSWER 18 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 1984-237329 [38] WPIX Full-text
 TI **Capacitance** sensor for liquid level detection - has variable delay circuits and phase discriminating circuit which output measured information
 DC S01; S02
 IN KATO R
 PA (KATO-I) KATO R
 CYC 2
 PIA US 4470008 A 19840904 (198438)* EN 9[10] <--
 CA 1182188 A 19850205 (198510)# EN <--
 ADT US 4470008 A US 1982-394836 19820702; CA 1182188 A CA 1982-406520 19820702
 PRAI US 1982-394836 19820702
 AB US 4470008 A UPAB: 20050421

The sensor comprises a pulse generating circuit; a number of variable delay circuits, each including as a component a variable **capacitance** transducer and adapted to delay a pulse from the pulse generating circuit by a time lag corresponding to a **capacitance** value of the transducer and then output the thus-delayed pulse. A phase discriminating circuit is adapted to discriminate a phase difference of the pulses output respectively from the variable delay circuits and then output measured information.
 USE/ADVANTAGE - Can be used to measure various parameters. The **capacitance** sensor is particularly effective as a liquid level detection sensor for liquid containing bottles used to **dispense** intravenous substances in drop-wise fashion. It is not required for the above sensor to reset its detectable threshold for the above sensor to reset its detectable threshold level for every material or item to be measured, because unnecessary variables such as temperature changes and dielectric constant changes of the material or item are cancelled out. The present **capacitance** sensor can be reduced in size, weight and fabrication cost. It is also capable of detecting very small changes in **capacitance**.

L56 ANSWER 19 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN
 AN 1983-D8255K [12] WPIX Full-text
 TI **Capacitive** level sensor for fuel tanks - contains reference **capacitor** chamber and pump eliminating water collection errors
 DC S02; X22
 IN KOBAYASHI H
 PA (NSMG-C) NISSAN MOTOR CO LTD
 CYC 3
 PIA DE 3229874 A 19830317 (198312)* DE 16 <--
 GB 2105473 A 19830323 (198312) EN <--
 US 4479116 A 19841023 (198445) EN <--
 GB 2105473 B 19850724 (198530) EN <--
 DE 3229874 C 19870521 (198720) DE <--
 ADT DE 3229874 A DE 1982-3229874 19820811; GB 2105473 A GB 1982-23201 19820812; US 4479116 A US 1982-408704 19820816
 PRAI JP 1981-133340 19810827

AB DE 3229874 A UPAB: 20060104

The level measurement device eliminates inaccuracies caused by water gathering between the plates or electrodes. It can also indicate the quantity of impurities, e.g. water, in the fuel, and can detect separation of benzine-alcohol mixtures into separate layers. A pump inside the tank completely fills a chamber (33) containing several parallel reference electrodes (34) also parallel to the direction of flow of the liquid through the chamber. Alternate electrodes are connected together to form a capacitor whose capacitance varies with the dielectric constant of the medium. The measurement and reference electrodes are connected to the level evaluation circuit.

L56 ANSWER 20 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1982-F1403E [18] WPIX Full-text

TI Fuel gauge for motor vehicle - has capacitor partially immersed in fuel so that its capacitance varies with fuel level

DC S02; X22

IN KOBAYASHI H

PA (NSMO-C) NISSAN MOTOR CO LTD

CYC 3

PIA GB 2086054 A 19820506 (198218)* EN 10 <--

DE 3133017 A 19820513 (198224) DE <--

GB 2086054 B 19840830 (198435) EN <--

US 4531407 A 19850730 (198533) EN <--

ADT GB 2086054 A GB 1981-23846 19810804; US 4531407 A US 1983-563273 19831219

PRAI JP 1980-146445U 19801016

AB GB 2086054 A UPAB: 20050421

The fuel gauge includes a stationary capacitor (10) located within a fuel tank (11) in such a manner as to be partially immersed in the fuel so that the capacitance of the capacitor varies with the level of fuel (28). In order to obviate the effects of water droplets (33) on the capacitance of the capacitor, the size of the gap between capacitor plates (10) is such that (i.e. 2.5-4mm) water droplets (33) suspended in the fuel spend the least possible time between the plates. A measuring device comprising; oscillator (22) counting circuit (40) and indicator (41) determines the time averaged capacitance of the capacitor to measure the level of the fuel (28) or the amount of fuel remaining in the tank.

L56 ANSWER 21 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1982-B1706E [05] WPIX Full-text

TI Suspended moisture capacitive flux meter - has capacitor ring with perforated plate catching liquid droplets and altering capacitance

DC S02

IN POPOV N V; SMIRNOV B K; SOLOVEVA I I

PA (LEKA-C) LENG D KALININ POLY

CYC 1

PIA SU 823867 B 19810423 (198205)* RU 3 <--

ADT SU 823867 B SU 1976-2435906 19761230

AB SU 823867 B UPAB: 20050421

Meter is suitable for humidity measurement and has advantage of possible use for measurement in volumes with variable velocities. This is achieved by the use of outer capacitor ring in the form of perforated ring and the inner plate is supplementarily fitted with centring elements made in the form of hermetic separating cylinders with the possibility of axial displacement and rotation around the axis. Moisture droplets carried by gas stream or droplets carried by atomised jet, pass through the perforated plate of unit (2) into measuring space (5). Due to aerodynamic resistance of the holes, the droplets cannot

come from the measuring space back to the stream. The moisture, having filled with volume of space (5), changes the capacitance of the capacitor. The time necessary for the change of capacitance determines the flow of the moisture droplets. After the end of measurement, electrode (3) is lowered down and turned through 180 degs. The centring element (8) covers the receiver and element (6) opens the moisture drain hole. In order to create excess pressure in the measuring space, air is applied via hole (4). Bul.15/23.4.81

L56 ANSWER 22 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1975-F2972W [20] WPIX Full-text

TI Non-conductive liquids level measmt. - using measuring and compensating capacitors and two-output operational amplifier

DC S02

PA (HEAT-R) HEAT POWER INSTR

CYC 1

PIA SU 435459 A 19741203 (197520)* RU <--

ADT SU 435459 A SU 1972-1862818 19721227

AB SU 435459 A UPAB: 20050416

Increased accuracy and reliability are obtained by making the transducer (2) from three parts, each contng. gate (K - K3). In the absence of liquid the capacity of (1) is equal to the (C1) and the output of the amplifier (3) is equal to the stabilized power supply output but opposite in polarity. The resistances (R1-R3) and when the pulses from generator (4) close the gates (K1-K3) charging current flows to the three networks. When there is liquid in the measuring section (1-1') the capacity of the transduces rises linearly in proportion to the liquid level. This causes a corresponding current rise in the charging network and voltage drop across the resistor (4). Any errors introduced by varying parameters of the measured liquid are eliminated by the compensation transducer (1').

L56 ANSWER 23 OF 23 WPIX COPYRIGHT 2007 THE THOMSON CORP on STN

AN 1974-36080V [19] WPIX Full-text

TI Liquid drops automatic dispenser - the falling liquid drop shorts two needle electrodes which control the drop counter

DC J04; S02

PA (ALMA-N) ALMA ATA CAST MECH FAC

CYC 1

PIA SU 393594 A 19731224 (197419)* RU <--

ADT SU 393594 A SU 1971-1684602 19710727

AB SU 393594 A UPAB: 20050414

Automatic measurement and flow stabilization are obtained by placing two electrodes in the path of the falling drops. Each drop shorts the electrical path between the needle electrodes thus completing a circuit to the control valve grid. The valve can operate any number of electrical components including a relay and a counter which can be used for dispensing 'triethanololine' (sic) fed to shaft cementation furnace. The dispensed liquid flows into cylinder and via a hole into the pipe of the shaft cementation furnace in the form of drops. The drops fall between the two needle electrodes closing the circuit to the grid of the valve. This operates a relay whose contact connects the capacitor to a resistor which counts the number of drops.

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(FILE 'HOME' ENTERED AT 14:34:59 ON 11 JUN 2007)
SET COST OFF

FILE 'WPIX' ENTERED AT 14:35:19 ON 11 JUN 2007

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L1      37617 S ?DROPLET?
L2      120197 S ?DROP
L3      45998 S ?DROPS
L4      177793 S L1-L3
L5      1467 S L4 AND B05B001/IPC, IC, ICM, ICS
L6      3869 S L4 AND B05B/IPC, IC, ICM, ICS
L7      15275 S L4 AND ?NOZZL?
L8      17396 S L5-L7
L9      828 S L4 AND (B11-C03 OR C11-C03)/MC
L10     818 S L4 AND R760/M0,M1,M2,M3,M4,M5,M6
L11     18148 S L8-L10
L12     203 S L11 AND G01F/IPC, IC, ICM, ICS
L13     183717 S L4 AND (PD<=20040227 OR PRD<=20040227 OR AD<=20040227)
L14     1752 S L13 AND G01F/IPC, IC, ICM, ICS
L15     38 S L14 AND ?CAPACITANC?
L16     2 S L15 AND L11
L17     36 S L15 NOT L16
L18     1 S L16 NOT BATH?
L19     37 S L17,L18
L20     16 S L19 AND ?CAPACITOR?
L21     11 S L19 AND ?DIELECTR?
L22     13 S L19 AND ?CAPACITI?
L23     24 S L20-L22
L24     13 S L19 NOT L23
L25     6 S L24 AND L1
L26     7 S L24 NOT L25
L27     4 S L23 AND L1
L28     20 S L23 NOT L24-L27
        SEL DN AN 1-3 3 15
L29     5 S L23 AND E1-E10
L30     102 S L14 AND ?CAPACIT?
L31     64 S L30 NOT L15-L29
L32     3 S L31 AND L1
L33     61 S L31 NOT L32
        SEL DN AN 27 29 59 60
L34     4 S L33 AND E1-E16
L35     19 S L25,L27,L29,L34
        E SHVETS/AU
L36     134 S E4-E17,E43-E50
        E MAKAROV/AU
        E MAKAROV S/AU
L37     210 S E3-E18
        E OSING/AU
L38     7 S E9
        E FRANKEN/AU
L39     7 S E12-E14
L40     343 S L36-L39
L41     1 S L40 AND G01F/IPC, IC, ICM, ICS
L42     11 S L40 AND B01L/IPC, IC, ICM, ICS
L43     5 S L40 AND B05B/IPC, IC, ICM, ICS
L44     4 S L40 AND (B11-C03 OR C11-C03)/MC
L45     4 S L40 AND R760/M0,M1,M2,M3,M4,M5,M6
L46     6 S L40 AND R530/M0,M1,M2,M3,M4,M5,M6
L47     2 S L40 AND (B11-C08B OR C11-C08B)/MC
L48     12 S L41-L47

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L49	13 S L40 AND L4
L50	19 S L48,L49
L51	11 S L50 AND L13 SEL DN AN 6-11
L52	5 S L51 NOT E1-E12
L53	23 S L35,L52
L54	23 S L53 AND L1-L53
L55	23 S L54 AND (?NOZZL? OR ?CAPACIT? OR ?DIELECTR? OR DI ELECTR? OR
L56	23 S L55 AND (G01F OR B01L OR B05B)/IPC,IC,ICM,ICS

FILE 'WPIX' ENTERED AT 15:25:10 ON 11 JUN 2007

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